ORION
CREW EXPLORATION VEHICLE

WEEKLY ACCOMPLISHMENTS

09.23.10

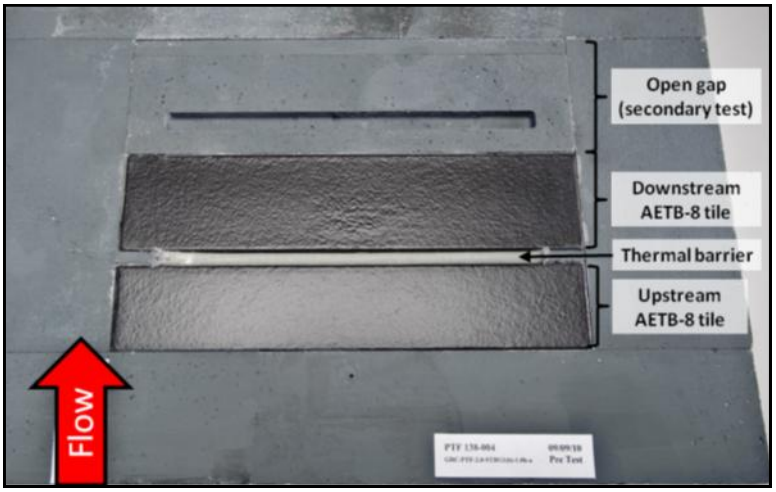
Aerojet successfully conducted a static firing of the third nozzle risk reduction motor (shown above and left) in support of the Orion jettison motor, a critical component of the launch abort system (LAS) for NASA's Orion crew exploration vehicle. The test was conducted in Aerojet facilities located in Folsom, Calif. This successful test firing validates several nozzle design changes implemented to enhance the safety and reliability of the jettison motor. The test successfully met all test objectives, providing data to validate analytical models and demonstrate the increased robustness of the new nozzle design modifications.

The NASA Orion team successfully completed another parachute airdrop test at the Army Yuma Proving Grounds test range in Yuma, Arizona. The objective of this airdrop test (shown above and in page 1 banner) was to determine the effect of increasing the geometric porosity on a single main parachute. Adjusting the porosity may provide increased parachute stability, which results in a more predictable landing 'speed', known as descent velocity. This results in safer landing conditions for the astronauts.

The test vehicle was a 7000 lb missile shaped structure called a Medium Drop Test Vehicle (MDTV) extracted from a C-130 aircraft at an altitude of 20,000 ft using a custom test platform which deployed the single main test parachute. The parachute team also successfully completed a second test drop of a two main parachute cluster further investigating the porosity effects. The parachute team will continue the planned test program in December following a period of data evaluation and test article buildup.

The Orion Crew Module (CM) Ground Test Article (GTA) was recently moved to the "birdcage" tool (shown left) at the Michoud Assembly Facility in New Orleans, Louisiana. The birdcage is a holding fixture used to assemble the thermal protection system backshell. In addition, the GTA team finished priming the exterior, performed fit checks of the TPS panels and continues the Non Destructive Evaluation (NDE) testing from the recent proof pressure test. All of the NDE scans have been completed with only 30% of the scans left to be analyzed. So far, no statistically significant differences have been observed between pre and post-proof NDE. The CM GTA will undergo continued assembly and outfitting in preparation for the planned test program which will be conducted at Lockheed Martin facilities in early 2011.

The Glenn Research Center (GRC) Seal Team recently completed the tile interface thermal barrier arc jet tests at the Ames Panel Test Facility in California. The test objectives were to gather tile-to-tile interface thermal response data for development of thermal models of Orion backshell interfaces as well as validate that the generic tile-to-tile interface thermal protection system (i.e., thermal barrier) design works as intended. In addition the team measured wall temperatures in open gaps with several aspect ratios in hypersonic flow under a constant heat flux/pressure environment. A total of fourteen tile-to-tile interface arc jet tests were successfully completed. All temperatures were well within structural and bond-line limits, and there was no evidence of significant heating within the interface.



Communications and Public Outreach

***BBC World* interviewed Pam Melroy, former astronaut and Lockheed Martin's Director and Deputy Program Manager, Space Exploration Initiatives Program Office, at the Exploration Development Lab (EDL) in Houston.** The interview took place in front of the full scale Orion mockup at the EDL where Pam is an integral part of the design of the next generation in spacecraft. Her interview will be part of a documentary about the innovation of the jet engine and flight.